CSE 322

OFFLINE - 2

NS2 Offline Report

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Wireless Mac Type : 802.11

802.11 is a set of wireless networking standards created by the Institute of Electrical and Electronics Engineers (IEEE). The 802.11 standards specify the physical layer and medium access control (MAC) layer for wireless local area networks (WLANs).

The 802.11 MAC (Media Access Control) layer is responsible for managing the access of multiple devices to the shared wireless channel and controlling the flow of data between devices. It defines the rules for how devices can communicate and share the wireless channel, including the frame format, transmission methods, and medium access control mechanisms.

The 802.11 MAC layer includes features such as:

- Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA): a protocol that enables devices to avoid collisions and fairly share the wireless channel.
- Request to Send/Clear to Send (RTS/CTS): a protocol that helps reduce collisions and improve performance in high-density networks.
- Authentication and encryption: mechanisms for securing wireless communications and preventing unauthorized access to the network.

Routing Protocol : AODV

AODV (Ad hoc On-demand Distance Vector) is a reactive routing protocol for mobile ad-hoc networks (MANETs). It is designed to allow nodes in a network to dynamically discover a path to a destination node when a network communication is needed.

AODV operates on-demand, meaning that it only establishes a route when it is needed, and routes are maintained only as long as they are being used. When a node wants to send data to a destination, it broadcasts a route request (RREQ) message to its neighbors. The RREQ message is

forwarded along the network until it reaches the destination or a node that knows the route to the destination. The destination node or the intermediate node that knows the route to the destination then sends a route reply (RREP) message back to the source node.

- On-demand routing: AODV only establishes routes when they are needed, reducing overhead and preserving network resources.
- Loop-free: AODV prevents routing loops by ensuring that each node only maintains one route to a given destination.
- Dynamic route discovery: AODV can dynamically discover new routes as the network topology changes.
- Efficient and scalable: AODV can efficiently handle a large number of nodes and can scale to support large networks.
- Support for mobility: AODV can handle network changes caused by node mobility, allowing nodes to move and change their locations without affecting network connectivity.

Agent Type : TCP TAHOE

TCP Tahoe is a congestion control algorithm used by the Transmission Control Protocol (TCP) to manage network congestion. TCP Tahoe is based on the principles of additive increase and multiplicative decrease (AIMD). It uses the TCP Slow Start and Congestion Avoidance mechanisms to dynamically adjust the sending rate of data to avoid network congestion.

- Slow Start: TCP Tahoe uses the Slow Start mechanism to gradually increase the sending rate of data. This helps prevent network congestion by avoiding a sudden burst of data that might overwhelm the network.
- Congestion Avoidance: TCP Tahoe uses the Congestion Avoidance mechanism to adjust the sending rate of data based on network conditions. If the network becomes congested, the sending rate of data is reduced to help alleviate the congestion.

- Fast Retransmit: TCP Tahoe includes a Fast Retransmit mechanism to quickly retransmit lost packets, helping to improve the reliability and performance of the data transfer.
- Fast Recovery: TCP Tahoe includes a Fast Recovery mechanism to quickly recover from lost packets, reducing the amount of time required to recover from a network congestion.

Application Type : TELNET

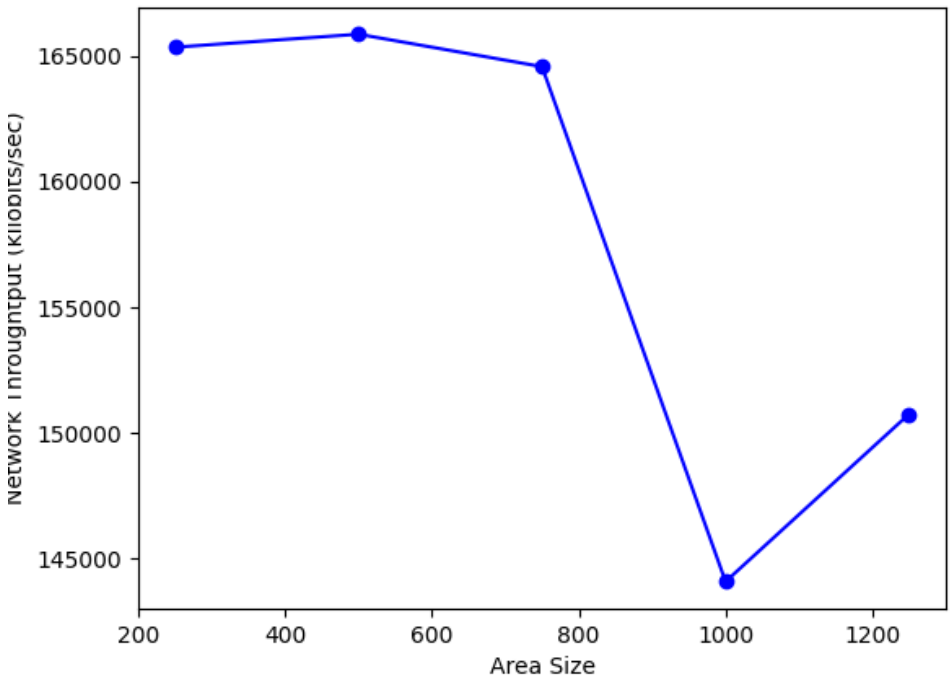
Telnet is a network protocol that allows users to connect to remote servers and access the command line interface of that server. It was one of the first and most popular network protocols for accessing remote computers and remains in use today.

Here are some key features of Telnet:

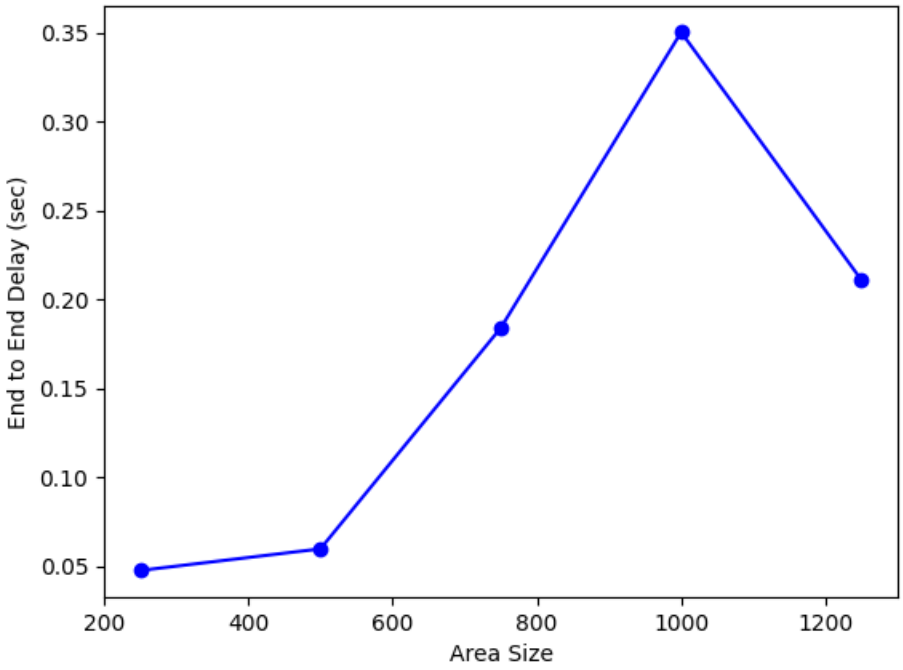
- Remote access: Telnet allows users to access remote computers over a network, enabling them to run commands and perform tasks on the remote server.
- Command line interface: Telnet provides a command line interface for accessing remote servers, enabling users to run commands and perform tasks on the remote server.
- Platform independence: Telnet is a platform-independent protocol, allowing users to access remote servers running on different operating systems.
- Text-based communication: Telnet uses a text-based communication format, enabling users to send and receive text-based data over the network.
- Port forwarding: Telnet can be used for port forwarding, allowing users to forward network traffic from one port to another.
- Network diagnostics: Telnet can be used for network diagnostics, allowing users to test the connectivity and functionality of network services and devices.

GRAPHS

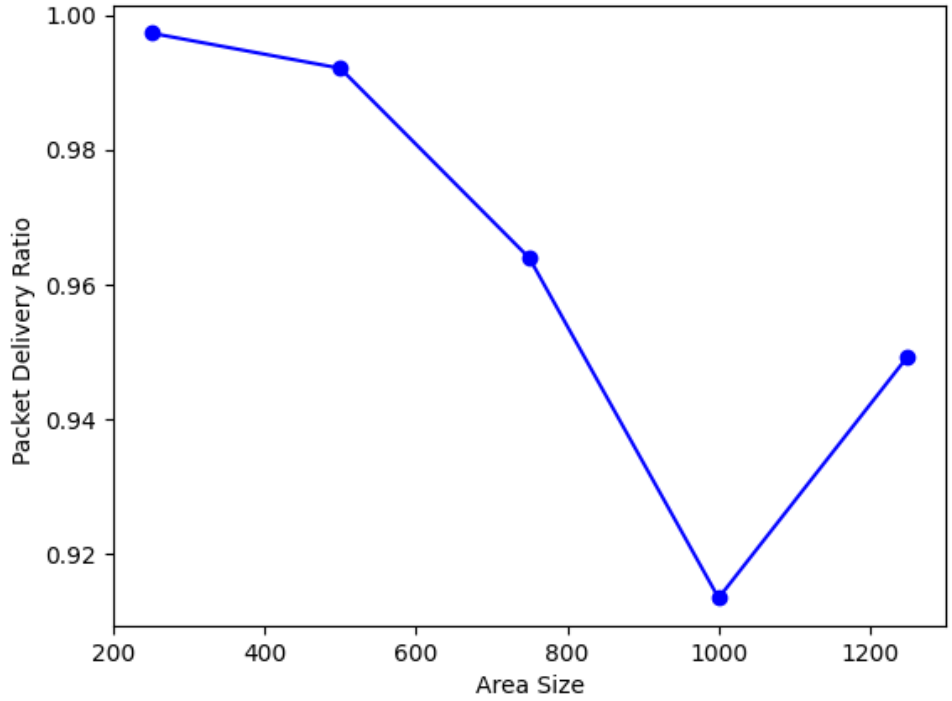
Area Size(m) vs Network throughput(kilobits/sec)



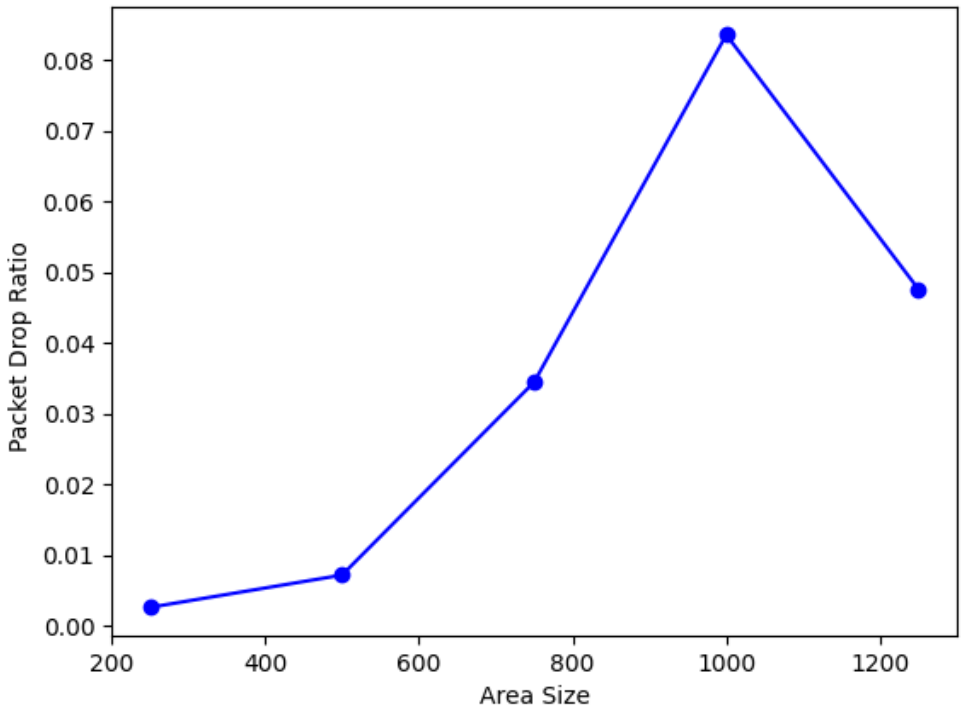
Area Size(m) vs End to End Delay(Sec)



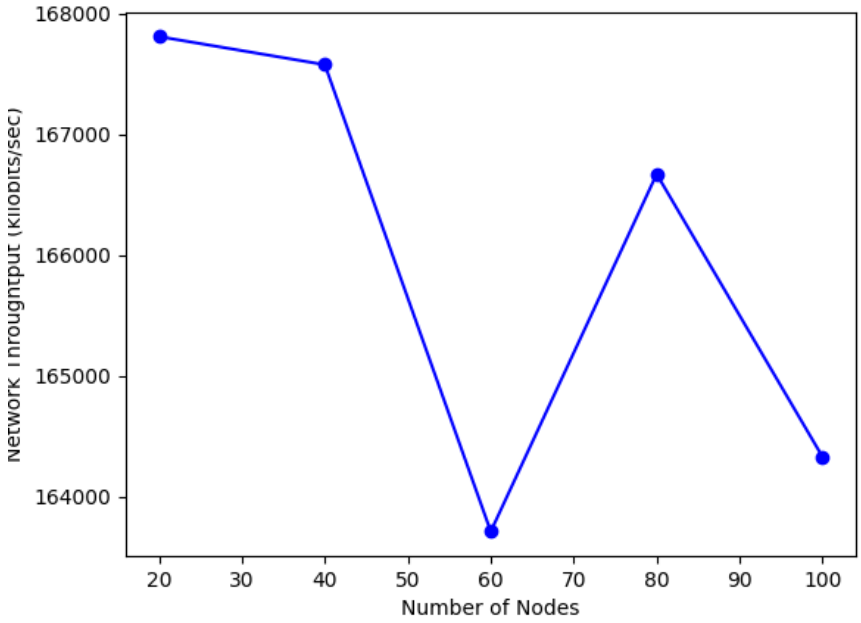
Area Size(m) vs Packet Delivery Ratio



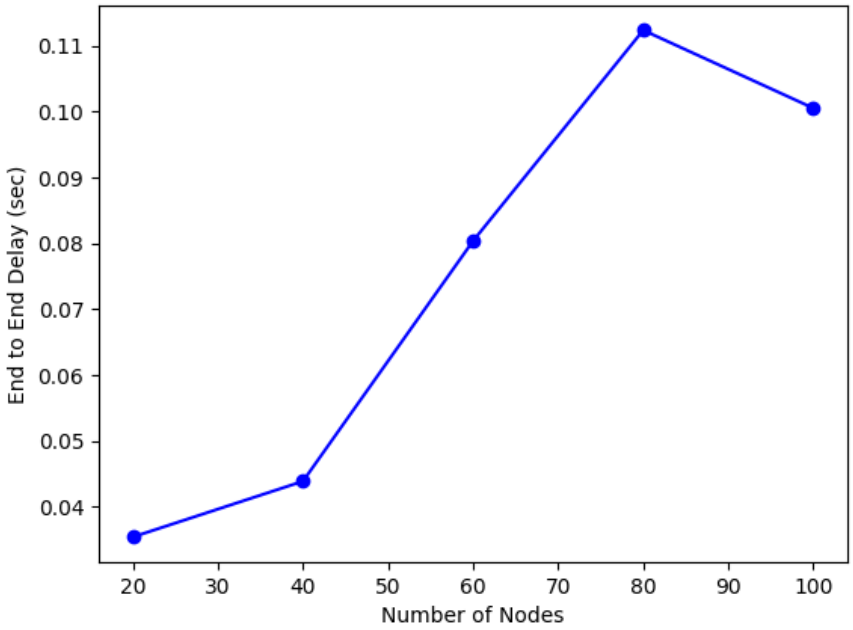
Area Size(m) vs Packet Drop Ratio



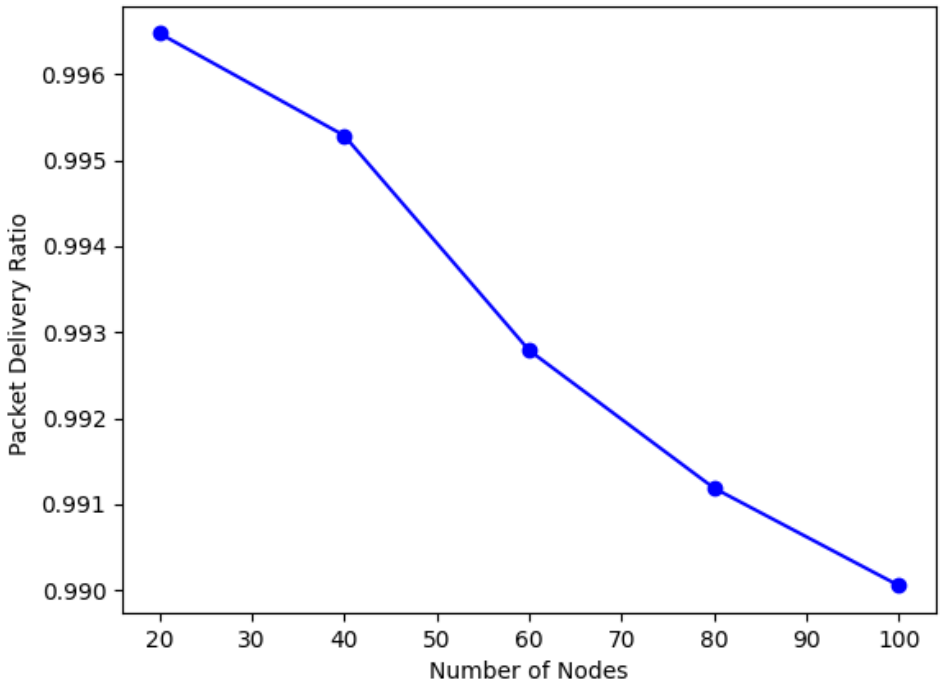
Number of Nodes vs Network Throughput(kilobits/sec)



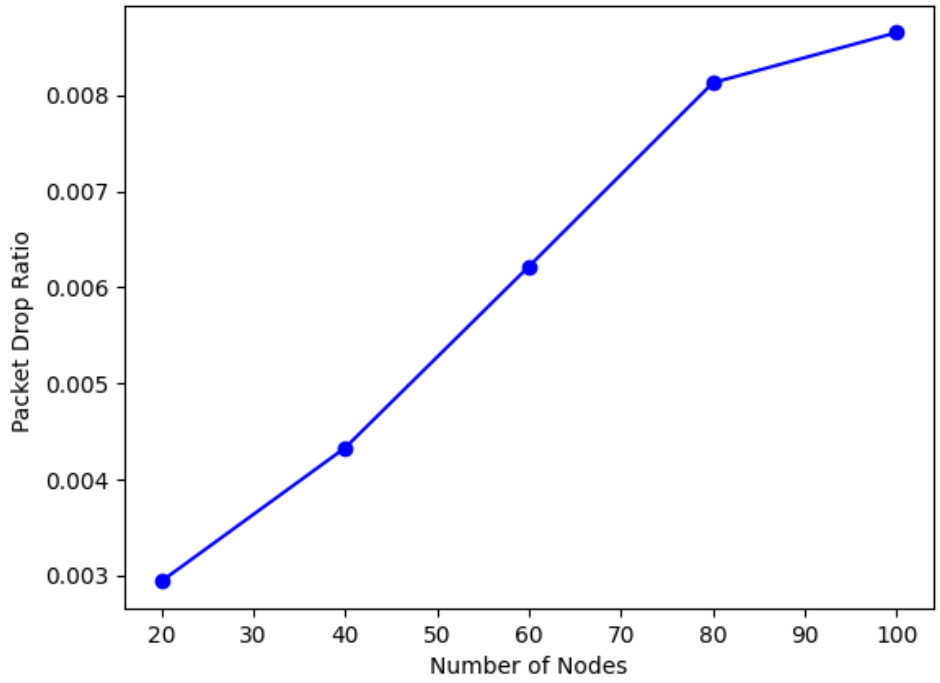
Number of Nodes vs End-to-End Delay(sec)



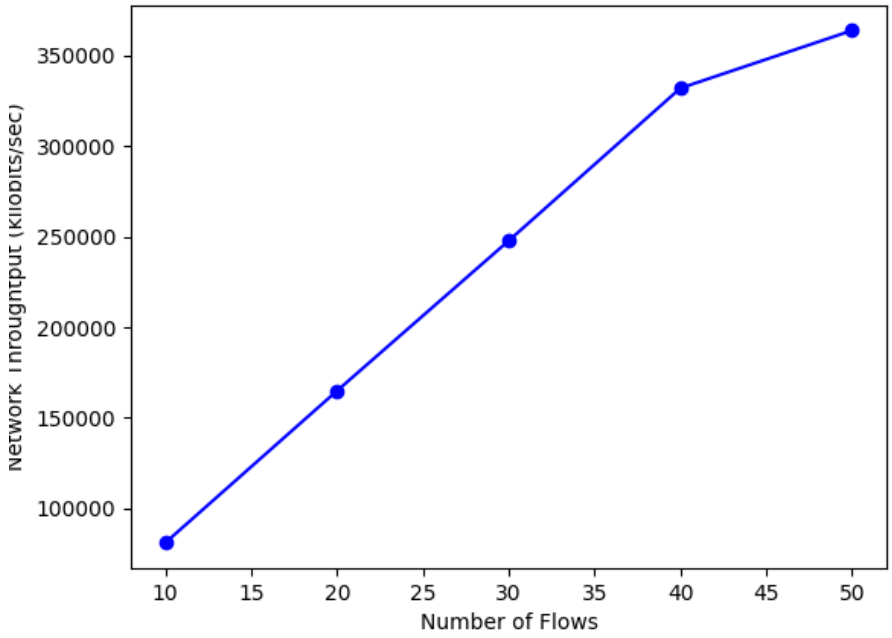
Number of Nodes vs Packet Delivery ratio



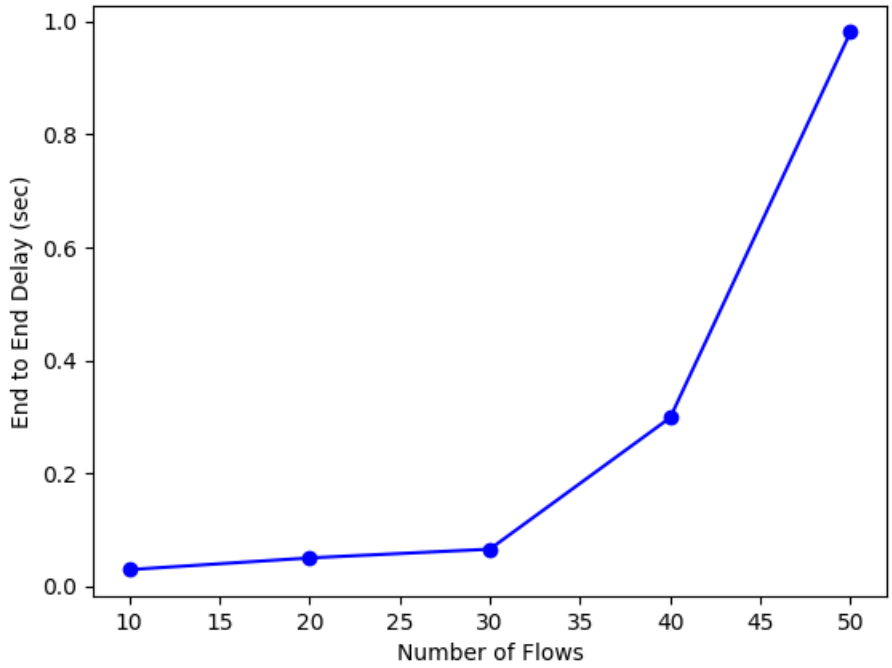
Number of Nodes vs Packet Drop ratio



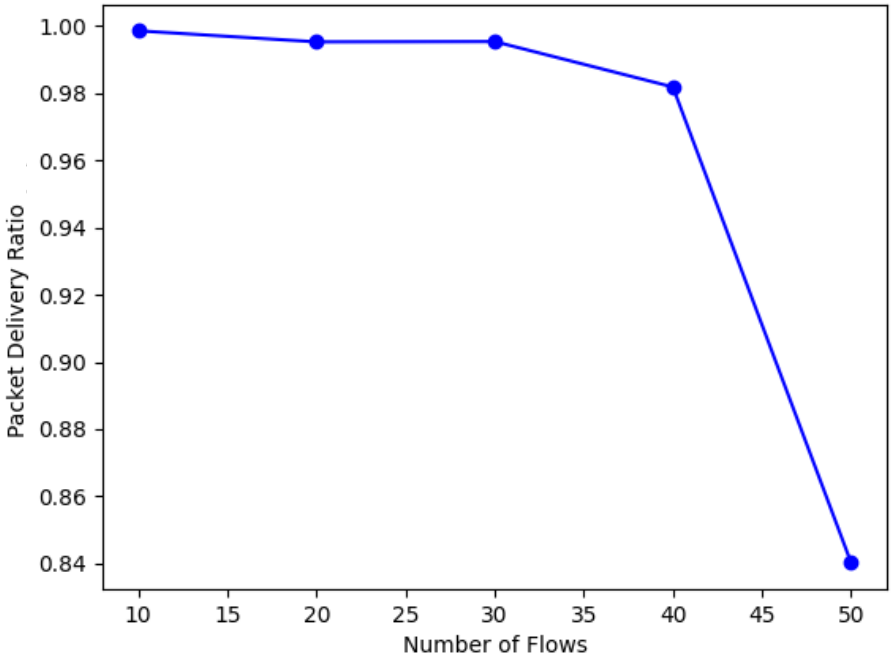
Number of flows vs Network Throughput(kilobits/sec)



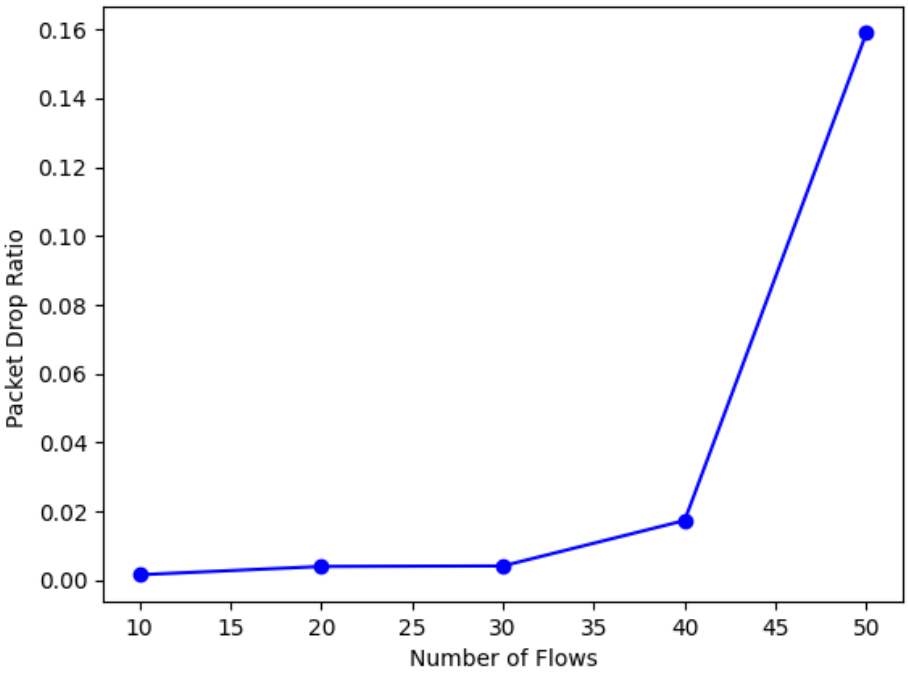
Number of flows vs End-to-End Delay(sec)



Number of flows vs Packet Delivery ratio



Number of flows vs Packet Drop ratio



Conclusion

1. Lower the Throughput, Higher the end-to-end delay.
2. Packet delivery ratio and packet drop ratio graph is quite reciprocal to each other.
3. Fewer the flow number, lower the packet drop ratio.
4. Fewer the flow number, higher the packet delivery ratio.
5. As Tcp Tahoe ensures reliability, packet delivery ratio is significantly higher than packet drop ratio.
6. Random movement and placements causes irregularity in packet Transmission.